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Original Research Article.

Musculoskeletal Disorders and Work Limitation Among Patients Attending Primary Health Centers, Jeddah, Saudi Arabia, 2020

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ABSTRACT

Background: Work-related musculoskeletal disorders are relatively common in Saudi Arabia among specific workers. The objective of this research was to estimate the prevalence of Work-related Musculoskeletal Disorders (WMSD) in primary care settings and their influence on workability.

Materials and Methods: This cross-sectional analytic study was done in Jeddah, Saudi Arabia, at Primary Health Care Centers (PHCC) affiliated with the Ministry of Health. It is made up of 377 adult patients who were chosen using a proportional selection approach. Participants were interviewed using the Nordic Musculoskeletal Questionnaire (NMQ) and the Work Limitation Questionnaire (WLQ) to obtain data. Statistical package for the social (SPSS) was used to analyze the data, and multiple linear regression was applied.

Results: 66.8% had WMSD in the past year, and 31.7% of them were unable to complete their routine activities (at home or work). Prevalence of WMSD was highest in the lower back (42%), followed by the neck (21%), and shoulders (19%). Elbows had the lowest frequency (2%). All the work limitation scales were shown to be significantly affected by the presence of WMSD in the multiple linear regression model.

Conclusion: In Jeddah, Saudi Arabia, WMSD was common among PHCC attendance. The lower back and neck had the highest prevalence of WMSD. The existence of WMSD was shown to have a substantial impact on all of the work limitation scales.

Keywords: Primary Health Care, Saudi Arabia, WMSD, Workability, Work Limitation.

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INTRODUCTION

A Musculoskeletal disorder (MSD) is an injury or dysfunction of the muscles, nerves, tendons, cartilage, joints, and spinal discs. The term "work-related musculoskeletal disorders" (WMSD) refers to situations in which the work environment and the tasks performed on the job have a substantial role in aggravating or prolonging an existing condition (Bernard, 1997). As an encompassing phrase, "repetitive strain injury" covers a set of conditions that emerge from repetitive activity, abnormal postures, persistent stress, and other risk factors.[1]

Overexertion-related injuries, such as sprains and strains, accounted for 31% of all cases of musculoskeletal disorders in 2015. This led to an incidence rate of 32.2 cases for every 10,000 full-time employees in 2015.[2]

Furthermore, MSDs were the most common WMSD. About 60% of European Union (EU)-28 workers have complained of MSD symptoms. Back and upper-limb muscle pains are the most reported MSDs by employees. 60% of EU workers with a work-related health issue say that MSDs are their most serious concern, and 20% of EU-28 employees have had a chronic back or neck disorder in the past year.[3] Studies in Saudi Arabia found that dental professionals, schoolteachers, healthcare professionals had a high frequency of WMSDs.[4-7]

According to Weevers et al.[8], the rate of GP visits for work-related illness was high, and the MSD were the most common cause for general practice appointments, with low back pain, neck pain, and shoulder pain accounting for the most complaints. Furthermore, the capacity to perform one's occupation duties may be compromised if one has a Work-related disorder.[8-10]

Workers in the private and local government sectors who suffered from MSDs missed a median of 12 days of work in 2015[2], and WMSD cost the United States $1.5 billion in direct costs and $1.1 billion in indirect costs in 2007.[11]

To the best of our knowledge, no studies have examined the prevalence of WMSD in Saudi Arabia's primary health care centers (PHCC) attendees. Therefore, this study aims to estimate the prevalence of WMSD in and to examine the impact of MSDs on workability.

METHODS AND MATERIALS

This cross-sectional analytical study was conducted at Primary Health Care Centers affiliated with the Ministry of Health in Jeddah city among adults attending the selected PHCCs during the study period. Ethical approval was obtained from the Institutional Review Board (IRB)/Ethics committee vides letter No. H-02-J-002/1406 dated 20/12/2020 and informed written consent was taken from all participants. All attendees of the selected PHCCs aged over 20 years during the study period were asked to participate in the study, provided that they engaged in the current work for at least one year. Exclusion criteria were age 20 years/below, working for less than one year, having history of previous musculoskeletal surgery and well-defined skeletal deformities. The total number of the Ministry of Health PHCC is 47 centers divided into five health sectors (East, West, North, South and Central). Simple random technique was adopted to select one PHCC from each sector. The sample size was equally distributed over the chosen 5 PHC centers and convenience non-random sampling technique was adopted to recruit patients from within the PHC centers. By using the Roasoft sample size calculator with the following parameters, the prevalence of the WRMDs is 50%, the population size is 100000 patients, the margin of error is 5%, and the confidence level is 95%, the calculated sample size is 377 patients. To overcome the non-respondents and excluded patients, the sample size was increased by 10%. Written consent from all participants was obtained, and the research team made sure to maintain the privacy of the research participants and the confidentiality of all information obtained during the study. Public health administration research committee approved this study.

A personal interview was used as a data collection technique. The research team invited patients to participate in the research and interview those who agree to participate. The questionnaire is divided into different sections, socio-demographic data, including the job type, WRMDs section, and causes of WRMDs. The validated NORDIC Musculoskeletal questionnaire (NMQ) was used for WMSDs data collection.[12] The NMQ can be used as a structured interview or as a questionnaire and considered the commonest one applied for assessing self-reported symptoms of all musculoskeletal disorders concerning nine main body areas (neck, shoulder, elbows, wrists/hands, upper back, lower back, hips, knees, and ankles/feet.[13] Also work limitation questionnaire was used in this study. Work limitation questionnaire is used to assess the impact of health-related problems on the ability to perform job roles. It is a 8-items tool investigates 4 domains: time management, physical tasks, mental interpersonal tasks, and output Tasks. The highest average score of work limitations was observed in the physical tasks scale while the lowest average score was observed in mental interpersonal tasks.[14] Permission to use both tools (NORDIC Musculoskeletal questionnaire and work limitation questionnaire) was requested from the corresponding authors through e-mail communication.

The data was analyzed using a statistical package for social sciences (SPSS) version 23. numerical variables were presented as mean and Standard Deviation (SD) and categorical variables as frequency and percentage, and the appropriate statistical tests were used to determine the effect of the independent variables, and their association with the dependent variable. Multiple linear regression analysis was used to identify the factors associated with work-limiting scales. P-value < 0.05 was considered statistically significant.

Table 1: Socio-demographic characteristics of participants (n=377)

Variable	Category	Frequency	Percent
Gender	**Male**	264	70%
	Female	113	30%
Age in years	**Mean ± SD (range)**	38.4±9.1 (20 - 60)	
Age categories	**20-34**	143	37.9%
	35-44	132	35%
	45-54	88	23.3%
	55 or more	14	3.7%
BMI	**Mean ± SD (range)**	28.1±6.7 (13.4 – 77.7)	
BMI categories	**Underweight**	12	3.2%
	Normal	107	28.4%
	Overweight	138	36.6%
	Obese	120	31.8%
Experience (years)	**Mean ± SD (range)**	13.4±9.4 (1 - 48)	
Occupation	**Office work**	13	3.4%
	Health and medical services	30	8%
	Worker, Technicians &Engineers	40	10.6%
	Administration	81	21.5%
	Military & Security	51	13.5%
	Education &Training	63	16.7%
	Customers services, Sales & marketing	17	4.5%
	Governmental sector	54	14.3%
	Private sector	18	4.8%
	Personal and other services	10	2.7%
Work hours/week	**Mean ± SD (range)**	38.4±4.6 (4 - 70)	

Table 2: Prevalence of WMSD (and 95% confidence interval), in relation to body region affected for the whole population

Body Region	Whole population (n=377) % (95%CI)	Gender			Age groups (years)				
		Males (n=264) % (95%CI)	Females (n=113) % (95%CI)	P value	20-34 (n=143) % (95%CI)	35-44 (n=132) % (95%CI)	45-54 (n=88) % (95%CI)	55 or more (n=14) % (95%CI)	P value
Neck	**21 (17-25)**	20 (15-25)	23 (15-31)	0.521	18 (11-24)	25 (18-32)	22 (13-30)	14 (-4-33)	0.433
Shoulders	**19 (15-23)**	18 (13-22)	23 (15-31)	0.241	18 (11-24)	23 (16-30)	17 (9-25)	21 (-0.1-43)	0.654
Elbows	**2 (1-4)**	3 (1-5)	1 (1-3)	0.211	2 (-0.3-4)	2 (-0.3-5)	3 (-0.4-7)	0 (0.0)	0.851
Wrist/hands	**5 (3-7)**	4 (1-6)	7 (2-12)	0.170	4 (1-7)	8 (3-12)	1 (-1-3)	7 (-6-21)	0.163
Upper back	**9 (6-12)**	7 (4-10)	15 (8-22)	0.012	11 (5-16)	7 (3-11)	13 (6-19)	0 (0.0)	0.294
Lower back	**42 (37-47)**	40 (34-46)	47 (38-56)	0.224	32 (24-39)	49 (41-58)	47 (36-57)	57 (31-83)	0.010
Hips/thighs	**4 (2-6)**	4 (1-6)	5 (1-9)	0.502	6 (2-10)	3 (0.1-6)	2 (-.1-5)	7 (-6-21)	0.378
Knees	**16 (12-20)**	15 (11-19)	19 (11-26)	0.354	13 (8-19)	16 (10-22)	19 (11-27)	21 (-0.1-43)	0.611
Ankles/feet	**11 (7-14)**	11 (7-15)	10 (4-15)	0.718	6 (2-9)	17 (10-23)	10 (4-17)	7 (-6-21)	0.028
Any	**67 (62-72)**	64 (59-70)	73 (64-81)	0.123	55 (47-63)	77 (70-84)	67(57-77)	86 (67-1044)	0.001

Table 3: Work limitations scales

Scale	Mean	SD	Minimum	Maximum
Time Management	21.75	0.580	0	100
Physical Tasks	22.65	1.468	0	100
Mental interpersonal Tasks	19.38	1.110	0	100
Output Tasks	19.43	0.520	0	100

Table 4: Multiple Regression analysis of work limitation scales and age, gender, occupation and affected body region

	WLQ Scale			Model
	Estimate	SE	P-value	r^2
Time Management				
Age (years)	0.053	0.139	0.703	0.113*
Gender	4.819	2.732	0.079	
Occupation	0.075	0.563	0.894	
Musculoskeletal symptoms	17.068	2.697	0.000	
Physical Tasks				
Age (years)	0.177	0.147	0.230	0.074*
Gender	-0.056	2.888	0.985	
Occupation	0.068	0.595	0.910	
Musculoskeletal symptoms	14.370	2.851	0.000	
Mental interpersonal Tasks				
Age (years)	-0.223	0.129	0.085	0.125*
Gender	5.361	2.534	0.035	
Occupation	0.869	0.522	0.097	
Musculoskeletal symptoms	16.623	2.502	0.000	
Output Tasks				
Age (years)	-0.358	0.138	0.010	0.122*
Gender	6.926	2.712	0.011	
Occupation	1.210	0.559	0.031	
Musculoskeletal symptoms	16.214	2.677	0.000	

*Models are significant at $P \leq 0.05$.

RESULTS

The study involved a total of 377 patients attending the MOH primary health care center in Jeddah. The average age of patients was 38.4 years SD ± 9.1 years) ranging from 20 to 60, and most of them aged between 20 to 34 years (37.9%). More than two thirds (70%) of the patients were males. The average BMI of patients was 28.1 (SD ± 6.7 ranging from 13.4 to 77.7,) and most of them have BMI in the overweight range (36.6%), obesity and normal weight were 31.8% and 28.4%, respectively. The average work experience of patients was 13.4 years SD ± 9.4 ranging between 1 to 48). Regarding their occupation, 21.5% had an administrative job and 16.7% had Education &Training jobs. The average time spent on the work per week was around 38.4 hours SD ± 4.6 ranging between 4 to 70, hours. Table 1 presented the socio-demographic characteristics for the participants.

The patients who have experienced trouble (ache, pain, discomfort, or numbness) during the last 12 months were 252 (66.8%) and 80 (31.7%) out of them have been prevented from doing their normal work (at home or away from home) because of the trouble. Furthermore, 137 (54.4%) of the participants had trouble during the last 7 days.

Table 2 presents the prevalence of WMSD during the last 12 months in relation to the body region affected, stratified by age and gender. Of the total participants,67% (95% CI 62 - 72) reported WMSD in any of the nine body regions. The highest

WMSD prevalence was for the lower back (42%), followed by the neck (21%) and shoulders (19%). The lowest prevalence was for the elbows (2%). Concerning gender, the prevalence of any WMSD for males and females were 64% and 73% respectively, but the difference was not statistically significant. Compared to males, females reported a statistically significantly higher prevalence of symptoms in the upper back region (P = 0.012).

In relation to age, the prevalence of any WMSD was significantly higher among the age group of 55 years or more (86%) compared to other age groups (P = 0.001). Also, age group of 55 years or more reported a statistically significantly higher prevalence for symptoms in the lower back compared to other age groups (P = 0.010). In addition, the symptoms in the ankles/feet were significantly higher among age group of 35 to 44 years (P = 0.028). Details are provided in Table 2.

Work Limitations Questionnaire – short form version 1.0[14] was

We conducted multiple linear regression with work limitation scales as dependent variables. The results revealed that the presence of WMSD was significantly associated with increases in scores of all work limitation scales (P = 0.000 for all scales). Female gender was significantly associated with increases in scores of mental interpersonal tasks and output tasks (P = 0.035, 0.011 respectively). Younger ages were significantly associated with increases in scores of output tasks (P = 0.010). Other variables did not have a significant effect on the work limitation scales. Further information is provided in table 4.

DISCUSSION

In the current study, we aimed to estimate the prevalence of work-related musculoskeletal disorders and identify their effect on workability among Primary Health Care Centers attendees. The current study revealed that 66.8% of participants complained of WMSD during the past 12 months, and 54.4% during the last 7 days and these disorders restricted the normal work of the participants. The prevalence in our study is like the previous studies that reported WMSD prevalence in Saudi Arabia, which ranged from 54.7% to 91.2%.[4,6,7] Also, very close figure was recently reported among nurses working in Saudi Arabia (63.8%).[15] Higher rates were reported recently among physiotherapists (83.8%)[16] and teachers (87.3%).[17] However, the aforementioned studies were carried out among specific groups such as dental staff, teachers, nurses, physiotherapists and medical practitioners while the present one included primary health care centers` attendees. Internationally, close to our figure, studies among teachers in China, healthcare providers working in the operation room in Ethiopia and teachers in Turkey reported rates of 66.7%, 64.2% and 60.3%, respectively.[18-20] Lower rates have been reported in other studies carried out in China (31.8%)[21] and Turkey (28%).[22]

The lower back, neck, and shoulders were the three most common sites for WMSD. This is consistent with earlier studies in Saudi Arabia[4,6,7,15-17] and international studies[18-22] that found comparable results.

For this population we determined that WMSD was significantly related to a specific age group, this result is consistent with other studies in Saudi Arabia.[23-27] Our study indicates that the female gender has a more significant WMSD in the upper back than males. However, in Felemban et al[28] study they found a significance in the lower back rather than the upper back.

The presence of WMSD was found to be significantly associated with increasing scores on all work limitation scales in our study. This is consistent with other studies in Saudi Arabia.[5,27]

This study has some limitations. First, as in all cross-sectional studies where only an association between the variables studied can be inferred by this study. Second, our study estimated the prevalence of WMSD in PHCC attendees, as the general population tends to be healthier than those who attend PHCC. Thus, this puts the generalizability of the result in question. On the other hand, this study estimates the prevalence of WMSD in a variety of occupations. The data collected using a validated and standardized questionnaire in conjunction with a one-on-one interview, reducing the amount of incomplete and missing data.

CONCLUSION

According to our findings, a significant number of participants reported having experienced WMSD. In addition, the lower back had the highest prevalence of WMSD, followed by the neck and shoulders. The lower back of older people had a higher WMSD than the upper back of females. Finally, it was found that the existence of WMSD had a significant impact on all work limitation scales.

Results from this study could be used to raise awareness of the high WMSD prevalence among PHCC attendees. As a result, all PHCC doctors are encouraged to start questioning patients with musculoskeletal symptoms if they have WMSD during their routine patient encounters.

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